A Comparative Study on Physical Fitness, Physiological Variable and IQ Level Between Active Sports Participants and Non-Active Sports Participants

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Synopsis

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INTRODUCTION

In order to find similarities, differences, strengths, weaknesses, and patterns between two or more entities—such as ideas, concepts, theories, practices, or systems—a comparative study is a type of research methodology. It can be used to solve issues, improve knowledge, and obtain insights into complicated processes in a variety of domains, including engineering, social sciences, humanities, physical education, and the natural sciences.

Physical Fitness

A state of health and wellbeing, physical fitness is more precisely the capacity to carry out daily tasks, sports, and jobs. A structured recovery plan, enough rest, moderate-to-intense physical activity, and a healthy diet are the main components of physical fitness. Ex- strength, explosive strength, endurance, flexibility, and agility.

Strength is the capacity to use force or strength, either mental or physical, to achieve a goal.

EnduranceThe ability of an organism to exert itself and stay active for an extended amount of time, as well as its capacity to withstand, recover from, and exhibit immunity to tiredness, damage, or wounds, is known as endurance.

Agility The capacity to quickly shift the body's position is known as agility or nimbleness, and it necessitates the integration of discrete movement skills utilizing a mix of reflexes, strength, endurance, balance, coordination, and speed.

Flexibity The anatomical range of motion of a joint or group of joints, as well as the length of the muscles that cross the joints to produce a bending motion, are known as flexibility.

Explosive strength The speed at which you can apply your strength is known as explosive strength. It consists of several rounds of strong loading in brief, fast movements interspersed with extended rest intervals. Physiological Factors

Physiological Variable

The quantifiable measures that show how the body's physiological systems are operating are referred to as physiological variables. These factors can be used to diagnose and treat a variety of medical issues, as well as to evaluate and track an individual's performance and health. **For example, body temperature, blood pressure, heart rate, and respiratory rate.**

Heart Rate: The frequency of the heartbeat, expressed as the number of heart contractions per minute, is known as the heart rate (pulse rate).
Blood pressure The force of circulating blood against blood channel walls is known as blood pressure, or BP. The heart's pumping of blood through the circulatory system is primarily responsible for this pressure.
Body Temperature: Along with heart rate, blood pressure, and breathing patterns, body temperature is one of the most crucial indicators of your health.
Vital Capacity A person's vital capacity is the amount of air they can breathe in after forced expiration or the amount of air they can exhale after maximal inhalation. Assessing a person's respiratory health is crucial.

IQ Level

The Intelligence Quotient, or IQ, is a standardized test of mental capacity. It is a numerical result obtained from a standardized exam that assesses a range of cognitive skills, including problem-solving, spatial awareness, and verbal thinking.IQ tests are used to evaluate cognitive ability for a variety of reasons, including clinical diagnosis, employment selection, and educational placement. They are intended to give an assessment of an individual's intellectual capacity. It's crucial to remember that IQ scores are not a perfect representation of intellect and shouldn't be the only way to assess a person's aptitudes or potential. Important facets of intelligence that are not measured by IQ tests include social skills, emotional intelligence, and creativity.

Active Sports Partcipants

Students that play sports as part of their extracurricular or academic program or who represent the school at the district, regional, or national levels are considered active participants. Students can gain socially, psychologically, and physically from participating in sports.

Non-Active Sports Participants

Those who do not engage in sports as part of their extracurricular or academic schedules are considered non-active sports participants. Even though they might not participate in organized sports, students who do not play sports can still benefit from physical activity and maintain a healthy lifestyle in a variety of ways. For example, taking dance lessons, yoga or pilates, walking or bicycling to school, etc.

STATEMENT OF THE PROBLEM

"A Comparative Study On Physical Fitness, Physiological Variable And IQ Level Between Active Sports Participants And Non-Active Sports Participants"

Research Question

1. To evaluate the physical fitness of athletes who participate in sports and those who do not.
2. To evaluate the physiological characteristics of both active and inactive athletes.
3. To determine whether the IQs of athletes who participate in active sports and those who do not differ in any way.

OBJECTIVE OF THE STUDY

1. To determine how the physical fitness levels of athletes who participate in active sports differ from those who do not.
2. To assess how the physiological variables of athletes who participate in active sports differ from those of athletes who do not.
3. To compare the IQs of athletes who participate in active and inactive sports.

DELIMITATION

- The survey will only include students enrolled in government and private higher secondary institutions in Uttar Pradesh's eastern region.
- The study will only include 600 students from the Eastern Region of Uttar Pradesh state, 150 of whom will participate in active sports or 150 of whom will not, attending private schools, and 150 of whom will participate in active sports or 150 of whom will not, attending government higher secondary schools.
- Only students between the ages of 14 and 17 will be included in the study.
- The elements that make up physical fitness Students' physical attributes, such as strength, endurance, agility, flexibility, and explosive strength, will be taken into account for this study.

- For the purposes of this study, just a few physiological parameters—blood pressure, body temperature, vital capacity, and heart rate—will be considered physiological variables.
- The study will be further limited by using the students' IQ as the psychological variable.

LIMITATIONS

- One of the study's limitations will be regarded as the nutrition, healthy lifestyle, and daily routine.
- During the test, no unique method will be employed to encourage the topic.
- The field test methodology was used to measure the physiological variables. This study's limitations were the variations in the value achieved when compared to the laboratory procedure.
- Topics pertaining to both urban and rural locations will be unmanageable.
- During an investigation, temperatures, climates, and other meteorological circumstances will be uncontrollable.
- Personal disturbances and moods that could lead to offensive reactions will also be regarded as limitations.

HYPOTHESIS

- H1. There may be a significant difference between the strength of Active sports participants and Non-Active Sports Participants.
- H12. There may be a significant difference between the endurance of Active sports participants and Non-Active Sports Participants.
- H13. There may be a significant difference between the flexibility of Active sports participants and Non-Active Sports Participants.
- H14. There may be a significant difference between the agility of Active sports participants and Non-Active Sports Participants.

- H15. There may be a significant difference between the explosive strength of Active sports participants and Non-Active Sports Participants.
- H16. There may be a significant difference between the blood pressure of Active sports participants and Non-Active Sports Participants.
- H17. There may be a significant difference between the heart rate of Active sports participants and Non-Active Sports Participants.
- H18. There may be a significant difference between the vital capacity of Active sports participants and Non-Active Sports Participants.
- H19. There may be a significant difference between the body temperature of Active sports participants and Non-Active Sports Participants.
- H110. There may be a significant difference between the IQ level of Active sports participants and Non-Active Sports Participants.

DEFINITIONS AND EXPLAINATIONS TERMS

Physical Fitness

A state of health and wellbeing, physical fitness is more precisely the capacity to carry out daily tasks, sports, and jobs. A structured recovery plan, enough rest, moderate-to-intense physical activity, and a healthy diet are the main components of physical fitness. Ex- strength, explosive strength, endurance, flexibility, and agility.

Strength- Strength is the capacity to use force or strength, either mental or physical, to achieve a goal.

Endurance- The ability of an organism to exert itself and stay active for an extended amount of time, as well as its capacity to withstand, recover from, and exhibit immunity to exhaustion, wounds, or damage, is known as endurance.

Agility-The capacity to quickly shift the body's position is known as agility or nimbleness, and it necessitates the integration of discrete movement skills utilizing a mix of reflexes, strength, endurance, balance, coordination, and speed.

Flexibility-The anatomical range of motion of a joint or group of joints, as well as the length of the muscles that cross the joints to produce a bending motion, are known as flexibility.

Explosive Strength-The speed at which you can apply your strength is known as explosive strength. It consists of several rounds of strong loading in brief, fast movements interspersed with extended rest intervals.

Physiological Variables

The quantifiable measures that show how the body's physiological systems are operating are referred to as physiological variables. These factors can be used to diagnose and treat a variety of medical issues, as well as to evaluate and track an individual's performance and health. For example, body temperature, blood pressure, heart rate, and respiratory rate.
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Body Temperature: Along with heart rate, blood pressure, and breathing patterns, body temperature is one of the most crucial indicators of your health.
Vital Capacity- A person's vital capacity is the amount of air they can breathe in after forced expiration or the amount of air they can exhale after maximal inhalation. Assessing a person's respiratory health is crucial.

IQ LEVEL

The Intelligence Quotient, or IQ, is a standardized test of mental capacity. It is a numerical result obtained from a standardized exam that assesses a range of cognitive skills, including problem-solving, spatial awareness, and verbal thinking.IQ tests are used to evaluate cognitive ability for a variety of reasons, including clinical diagnosis, employment selection, and educational placement. They are intended to give an assessment of an individual's intellectual capacity. It's crucial to remember that IQ scores are not a perfect representation of intellect and shouldn't be the only way to assess a person's aptitudes or potential. Important facets of intelligence that are not measured by IQ tests include social skills, emotional intelligence, and creativity.

Active Sports Participants

pupils that play sports as part of their extracurricular or academic schedule are known as sports-playing pupils. Students can gain socially, psychologically, and physically from participating in sports.

Non-Active Sports Participants

Students that do not play sports as part of their extracurricular or academic schedule are known as non-sporting students. Even though they might not participate in organized sports, students who do not play sports can still benefit from physical activity and maintain a healthy lifestyle in a variety of ways. For example, taking dance lessons, yoga or pilates, walking or bicycling to school, etc.

SIGNIFICANCE OF THE STUDY

• The physical fitness of both active and non-active sports participants in the eastern section of the state of Uttar Pradesh will be demonstrated by this study.
• The physiological differences between active and non-active sports participants in the eastern section of the state of Uttar Pradesh will be demonstrated by this study.
• The IQ levels of active and non-active sports participants in the eastern section of the state of Uttar Pradesh will be compared in this study.
• This study will support future research by other scholars and physical education instructors.
• Teachers who teach physical education and other subjects will benefit from this research by learning better ways to instruct, clarify, and train the kids.

CHAPTER - II

REVIEW OF RELATED LITERATURE

A review of related literature is an essential and important step for scientific research projects. It helps the investigator to develop a deeper insight into the problem and gain information on what has been done before in the field. Such reviews provide the basis for assessing the need for the study, and formulate the design and tools to be used.

The previous chapter dealt with a brief introduction of the variables namely, physical fitness, physiological variable, and IQ level need and importance of the study, objectives, and limitations of the study. In the present chapter, the investigator has discussed the review of related literature.

This chapter reviews the relevant studies on physical fitness, physiological variables, and psychological variables carried out to find out the research gap. Reviewing the previous literature not only highlights the historical works in the area but also helps to identify the niche in the area. Moreover, to know the method of analysis followed and the discussion made in the various, previous studies the following review is made by the researcher.

Dr. Amit Anurag 2015 - Sports performance is how sport participation is measured. Sports performance is a complex mixture of biomechanical function, emotional factors, and training techniques. Elite athletes need a thorough understanding of all the components to be successful so that training sessions can be tailored to their individual needs. The results of the present study highlight the comparison of physical & physiological variables between Gymnast and Malkhamb players. Physical fitness variables were grip strength & abdominal strength whereas physiological variables consisted of vital capacity and maximum breath-holding capacity. As far as differences are concerned significant differences are found in grip strength and abdominal strength and Gymnast was observed better in both components. It is

recommended that elite players may be undertaken for further study, it will also help in the identification of talents for sports.

Ashok Kumar 2017 - From ancient times to this electronic age, human beings tend to excel in every field of life. A large number of countries in the world always work hard and try to achieve the topmost position in the field of games and sports, that's why they try to produce top class /excellent sportsmen/ players' who put colorful feathers in the cap of their country/ nation. Enhancement in the performance of sportsmen is the focal point of attention for their coaches / physical education teachers/ researchers/ sports scientists and physical trainers in the country. It is in fact that the records in the history of games and sports that were established in the past were re-written in the present times, this is due to the constant development/ research in the field of games and sports. This research indicates an initial attempt to explain the physiological and physiological aspects of wrestlers performing at the professional level, thereby establishing a baseline to which future investigations can be compared he took up this comparative study of psychological and physiological aspects among categorized skilled wrestlers from different teams participated to know the contribution of psychological and physiological aspects among wrestlers from different performance.

Dr. Gopa Saha Roy1*, Mr. Priyatosh Mondal2, Miss. Neetu Dutta 2020 - Physical challenge is the consequence of an impairment that may be physical, cognitive, mental, emotional, developmental, or some combination of these. Objective: The purpose of the present study was to examine the health status, peak expiratory flow (PEF) and flexibility, and motor fitness components of physically challenged school boys and compare them. Method: A total of ten (N=10) physically challenged boys was chosen randomly for this study, among them ten (N=10) were orthopedically disabled (OC), ten (N=10) were hearing impaired (HI) and ten (N=10) were visual impaired (VI). BMI, PEF, flexibility, and motor fitness components was the criterion measures of this study. Mean SD was calculated as descriptive statistics and the significance of inter-group difference was analyzed by ANOVA

only a 0.05 level was considered to judge the significance of the study. All the statistical procedure was done by the standard statistical software. Result: The result revealed that significant differences exist (P>0.05) with respect of BMI (F=6.5) among this OH, VI, and HI. The mean value of the challenged pupil was between WHO and IMCMR standards. The result also showed that a significant difference exists (0.05 level) with respect of physiological and motor fitness variables among OC, VI, and subjects. All groups of physical challenge boys 14 14-16years old had lower health standards in respect of national and international standards in respect

Dr. Kalidas Karak, Tapas Mandal 2016 - Fitness has a great significance in the lives of human beings from time immemorial. Total fitness looks at the overall individual, combining the absolute levels of physiological, psychological, social, and cognitive fitness. The purpose of the study was to compare the Physical fitness between physical education students and general students (age group 17-20 years). Materials & Methods: A total of 60 subjects were taken for the study from S.B.S.S Mahavidyalaya, Goaltore, Paschim Medinipur, and West Bengal. To measure the Physical fitness AAPHER YOUTH FITNESS TEST BATTERY (1976) was used. The test items consisted of the AAHPER YOUTH fitness test i.e. pull-ups for boys, bent knee sit-ups, standing broad jump, shuttle run, 50 yards dash, and 600 yards run and walk. To compare the physical fitness between physical education students and general students (age 17-20 years) the independent t-test was conducted at a 0.05 level of significance. Results & Discussion: The findings of the present study reveal that there was a significant difference found in pull-ups, sit-ups, standing broad jump, shuttle run, 50 yards dash, and 600 yards run and walk for knowing the Arm and shoulder Strength, Abdominal strength, Leg strength, Agility, Speed and Cardiovascular Endurance respectively. Conclusion: Based on the obtained result, it has been observed that Physical education students have more Arm and Shoulder strength, Abdominal strength, Explosive leg strength, Agility, Speed, and Cardio-Vascular Endurance than General students for the involvement in games and sports and doing the various types of physical activities

Muneeb Ul Hassan Dar and Majid Mohmmad Wani 2017 - The world of games and sports has crossed many milestones as a result of different achievements. Scientific investigation into the performance of sportsmen has been playing an increasingly important role in attaining excellence of performance in different sports. Because of the involvement of new scientifically substantiated training methods and means of execution of sports exercises such as techniques and tactics. The purpose of the study was a frame to compare the Physiological and Psychological Variables among Vegetarian and Non-Vegetarian Runners of Kashmir (Baramulla). For that purpose, 40 subjects were selected 20 Vegetarian and 20 Non-vegetarian. The subjects were selected from Kashmir University (India). By purposive sampling method. Student's test was applied to calculate the collection of data. With the 0.05 level of significance.

Praveen Kumar Mishra 2017 - To compare the Physiological Variables and Physical Fitness variables between the National level Basketball and Handball Female Players. To achieve the purpose of this study 30 Basketball and Handball Female players i.e. Basketball (n=15) & Handball (n=15), who participated in the inter-college completion organized by Sardar Patel University, Anand, Gujarat, India were randomly selected and used as subjects in this study. The age group ranged from 18-25 years. The study was taken to pinpoint the Physiological Variables and Physical Fitness variables. Therefore, based on literary evidence and scholar's understanding the following variables were selected for this study: 1) Resting Heart Rate, 2) Resting Respiratory Rate, 3) Strength & 4) Endurance. To test the significance of the mean difference between the Basketball and Handball players, the statistical technique of 't-test was applied. The mean 1.68 and SD 3.85 of Resting Heart Rate of Basketball and Handball female players were respectively 1.67 and 3.00 and the calculated t value 0.63. The Mean and SD of the Resting Respiratory Rate of Basketball and Handball female players were respectively 65.11 & 3.62 and 65.77 & 2.57 and the calculated t value was 0.57. The strength of the Mean & SD of basketball female players was 7.03 &.06 and in handball was 6.99 & 0.07, with a Mean difference of 0.03, a standard error of 0.02, and the calculated t value of 1.34; The Mean & SD of Endurance of basketball players and handball

female players were respectively 14.01& 0.07 and 14.07 & 0.24 and the calculated t value 0.90. Table the t value shows that in Physiological Variables namely Resting Heart Rate, Resting Respiratory Rate there is no significant difference between basketball and handball female players. When compared to the mean values of both the groups, finally it has been found that basketball players have considerably average than handball female players in Resting Heart Rate, Resting Respiratory Rate, Strength, and Endurance.

Radheshyam Shukla and Dr. Vijay Chahal 2021 - Purpose: To compare the selected physical and physiological variables of Kabaddi and Football inter College Players Participants 30 players of Football and 30 Kabaddi represented their school in the interschool tournament during the 2014-15session from Deoria, U.P were selected as subjects, their age ranged from 15 to 18 years. Methodology: The study was an experimental research, the selected physical fitness and physiological variables such as speed, explosive strength, and cardiovascular endurance were tested. Analysis of data: ' t-tests were applied to check the significant difference between the group. The Level of Significance was set at 0.05 level. Results: There was a significant difference between physical i.e. flexibility and explosive strength & physiology variables and there was no significant difference between physical variables i.e. Endurance and agility. Conclusion: it was concluded that there was a significant difference in some selected physical & physiological variables i.e. speed, explosive strength & endurance, and agility.

Kh. Rakesh Singh 2020 - The motive behind the study was to compare selected physiological and physical fitness parameters between short-distance swimmers and sprinters. The study was carried out in 20 males, 10 swimmers, and 10 athletes from Degree College of Physical Education (HVPM) Amravati between the age group of 18-25 years. The selected variables were examined statistically by applying an independent t-test. In conclusion, the study showed that there was a significant difference observed in vital capacity, flexibility, maximum strength, cardiovascular endurance, and in thigh fat % but an insignificance difference was observed in resting pulse rate, SPO2, and in abdomen and

biceps fat %. Swimmers have shown significantly less flexibility as compared to sprinters, so the researchers suggested focusing on flexibility during training for better performance.

CHAPTER-III

METHODOLOGY

PROCEDURE

This chapter describes the methods used for subject selection, variable selection, criterion measurements, data reliability, data collection, test administration, research design, and statistical procedures for data analysis.

SELECTION OF SUBJECTS

600 students from the Eastern Region of Uttar Pradesh state participated in this study: 150 were active or non-active sports players from private schools, and 150 were active or non-active sports participants from government higher secondary schools. For athletes who participate in competitive sports and represent the school at the district, regional, or national levels, as well as for athletes who do not participate in competitive sports but have demonstrated some academic success in their grades or tests.

SELECTION OF VARIABLES

After reviewing numerous reviews of relevant literature from the Lakshmibai National Institute of Physical Education, Gwalior library, the researcher spoke with the supervisor about the subject. In order to choose relevant physiological, IQ, and physical fitness characteristics, research scientists also spoke with a variety of experts.

The following factors will be chosen for the study: IQ level, psychological characteristics, and physical fitness, in addition to literature and expert opinion, and also taking into account the administrative viability.

SELECTION OF TESTS

The following methods will be used to evaluate the chosen factors, depending on the availability of the questionnaire, tools, and equipment as well as the review:

• Advanced IQ exam using the Philip Carter Questionnaire and others.

• The Mensa Norway IQ Test

• P.N. Mehrotra, a mixed-type group IQ exam (verbal and nonverbal questionnaire).

Various equipment and test methods are taken into consideration in order to measure physical fitness factors. For example, a dynamometer will be used to measure grip strength.

- Flexibility will be assessed using the sit-and-reach test.
- The wide jump standing test will be used to gauge explosive power.
- The agility test will be a 10 x10 meter shuttle run.
- The endurance test will be an 800-meter run.

Various instruments will be taken into consideration in order to measure physiological factors.

- Vital capacity will be measured using a spirometer.
- Blood pressure will be measured using a sphygmomanometer.
- To measure heart rate, stethoscope equipment will be utilized.
- Body temperature will be measured using a thermometer.

TEST ADMINISTRATION

A variety of tests will be used to determine physical fitness.

• Strength will be measured using a dynamometer. The athlete uses their dominant hand to apply as much grip pressure as they can on the dynamometer. The assistant records the maximum reading (kg). The athlete repeats the test three times, and the assistant then evaluates the athlete's performance using the highest recorded value.

• The sit-and-reach test will be used to gauge flexibility; the feet's heels should be between 10 and 12 inches from one another and touch the taped line. With their arms extended, the client or patient should slowly reach forward as far as they can, placing one hand on top of the other with palms down. They should hold this position for around two seconds.

• A 10x10 shuttle run test will be used to measure agility. Mark two lines 10 meters apart with cones or marking tape. On the line opposite the one they will begin at, the two blocks are positioned. The contestant positions their front foot behind the starting line when the "ready" signal is given. The participant races to the other line, picks up a block of wood, runs back, and sets it on or beyond the starting line when the signal "Go!" is given. They then turn without stopping and sprint back to get the second block, which they then carry back across the finish line. It covers 40m in total. There are two trials.

• An 800-meter run will be used to gauge endurance; the goal of the test is to finish the 800-meter course as quickly as feasible. All competitors form a line behind the starting line to begin. The clock will start when the command "go" is given, and they will start running at their own speed. To motivate the participants to set their best time, it is also acceptable to cheer or yell out the elapsed time.

• A broad jump is used to gauge explosive strength. The athlete places their feet slightly apart and stands behind a line drawn on the ground. To produce forward momentum, the arms are swung and the knees bent during a two-foot takeoff and landing. The participant aims to leap as far as they can while landing on both feet and avoiding a backward tumble.

Several instruments will be taken into consideration in order to assess physiological factors.

• Sphygmomanometer: Attach the cuff tubing to the sphygmomanometer tubing and secure it. This will measure blood pressure. The patient's arm should be resting on a level surface. Listen to the pulse by placing the stethoscope over the brachial artery, which is located in the elbow bend. Slowly pump up the cuff and listen for the pulse to stop.

• A spirometer will be used to measure vital capacity; sit up and hold the device. Put the spirometer's mouthpiece in your mouth. Make sure your lips form a tight seal over the mouthpiece. Exhale normally after exhaling. Make a slow inhalation.

• A thermometer will be used to measure the body temperature. Rinse the tip after cleaning it with cold water and soap. Activate the thermometer. Place the tip toward the back of your mouth, beneath your tongue. Enclose the thermometer with your lips. Hold off till it flashes or beeps. Verify the display's temperature.

• A stethoscope will be used to measure your heart rate; position it directly on your chest, back, and abdomen.

All individuals will get explanations and instructions regarding the goal and methodology of completing the questionnaire prior to its distribution. Each participant must review the questionnaire and the available response options after getting it and endeavor to respond appropriately. The results of this study's questionnaires will be documented in accordance with the standards.

CRITERION MEASURE

Data will be gathered through the use of medical equipment, physiological variables (heart rate, blood pressure, vital capacity, and body temperature), numerous tools and tests for physical fitness variables (strength, endurance, agility, flexibility, and explosive strength), and a questionnaire on specific psychological variables (IQ level).

STATISTICAL TECHNIQUE

The mean, standard deviation, and ANOVA test will be utilized to examine and contrast the chosen psychological, physiological, and physical fitness variables of students who participate in sports and those who do not.

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